BATHING

AND

THE BUXTON WATERS.

BY THOMAS CARSTAIRS, M.D., M.R.C.S.E.,

AND ONE OF THE MEDICAL OFFICERS OF THE BUXTON BATH CHARITY.

Second Edition.

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PREFACE TO THE FIRST EDITION.

So much mischief is yearly done by an improper mode of using the Buxton Waters, and so much prejudice against them thereby created, that it appears to me to be the duty of every one who has had opportunities of studying the subject to give the result of his experience in the shape of caution and advice to those who expect to benefit by their use. The following pages are submitted to the public with this view, and the author has endeavoured to simplify his language, and divest the subject as much as possible of technicalities, so that it might be perfectly intelligible and plain to every one. If any portion of his suffering fellow creatures resorting to Buxton for the benefit of its waters should be relieved by adopting the practice he recommends, his object in this publication will be attained.

The Square, Buxton,
June 14, 1847.

PREFACE TO THE SECOND EDITION.

The First Edition of this work being exhausted, I have endeavoured, in publishing a second, to give an accurate account of the present state of the Baths and Waters, and to point out the mode of using them, which further experience has proved to be the most successful. A great part is rewritten, and the recent discoveries in chemistry have enabled me to offer, for the first time, a rational explanation of their action in disease. It would not have been in accordance with the design of this book to have entered more minutely into this branch of the subject, and therefore I have limited my observations to a mere statement of the principle on which their efficacy depends. But I hope I have made it clear that their invigorating effects are in obedience to the laws which regulate chemical and vital phenomena.

T. C.

May 30th, 1850.

THE BUXTON WATERS.

CHAP. I.

ON THE STRUCTURE AND FUNCTIONS OF THE SKIN.

Great efforts have been made during the last twenty years to extend a knowledge of physiology among all classes of the people,—teaching them the structure and functions of the various portions of their frame, with the humane object of persuading them how necessary an observance of the natural laws is for the preservation of health. Although the exertions of these philanthropic teachers were at first attended with little encouragement, they persevered in their labours, and of late years there has been a gradual desire rising up on every side for a more intimate acquaintance with the physical formation of man, and sounder views of the philosophy of living have been steadily gaining ground. The present age is truly one of enquiry, research, and, if beneficial and attainable, of practice. Mankind now do not take up a theory on the authority of some great name, and blindly act upon it. They sift, try, and prove it—rejecting it if wrong, and adopting it if right. They must have sound reasons before they will believe new propositions, but when convinced of their truth, they willingly assist in removing every impediment calculated to retard their progress, particularly if they have for their end the moral or physical improvement of the human race.

One of the points principally dwelt upon by all writers and lecturers on popular physiology has been the importance of the skin, as a secreting and excreting organ, and the impossibility of preserving health unless its important functions were properly performed, which could only be by constant

attention to cleanliness and bathing. Although the truth of this was universally acquiesced in by all who paid any attention to the subject, still for years they rarely acted up to what they could not help believing. With the exception of the hands, face, and feet, the great extent of the skin never came in contact with water at all, but almost from the cradle to the grave, was suffered to be plastered over with its own accumulating secretion, till the wonder arose that it was pervious at all. That even moderate health was enjoyed under such carelessness would appear impossible, did we not know what efforts Nature is capable of making, even when her laws are infringed upon, and how she often kindly substitutes increased action in one organ to compensate for the deficiency of another. But this state of things cannot last always, and by compelling one part to perform a function for which she has provided another, a double burden is imposed, under whose weight the overtaxed organ must sooner or later give way.

The skin performs two most important offices in the animal economy—it is a drain through which a certain portion of the *debris* or worn-out particles of the body is given off in the form of perspiration, by means of its numerous tubes; while, at the same time, it is the index which, by means of sensibility, conveys to the mind the temperature of the surrounding media. To shew the necessity of having the course of these perspiratory tubes or drains perfectly clear, and to give some idea of the mischief which must arise if they are impeded, it is only necessary to refer to their extent as estimated by Dr. Erasmus Wilson, in his lately published "Treatise on Healthy Skin." He says, "To arrive at something like an estimate of the value of the perspiratory system in relation to the rest of the organism, I counted the perspiratory pores in the palm of the hand, and found 3,528 in a square inch. Now, each of these pores being the aperture of a little tube about a quarter of an inch long, it follows, that in a square inch of skin on the palm of the hand there exists a length of tube equal to 882 inches, or 73½ feet. * * * To obtain an estimate of the length of tube of the perspiratory system of the whole surface of the body, I think that 2800 might be taken as a fair average of the number of pores in

the square inch, and 700, consequently, of the number of inches in length. Now, THE NUMBER OF SQUARE INCHES OF SURFACE IN A MAN OF ORDINARY HEIGHT AND BULK IS 2,500; THE NUMBER OF PORES, THEREFORE, 7,000,000, AND THE NUMBER OF INCHES OF PERSPIRATORY TUBE 1,750,000, THAT IS 145,833 FEET, OR 48,600 YARDS, OR NEARLY TWENTY-EIGHT MILES.

Let me ask, is it possible, with this calculation, which my own observation with the microscope proves to be rather under than over the mark, to over-estimate the value of preserving the skin in a sound, healthy condition? Night and day, it is constantly at work, exuding worn-out particles of the body held in solution by the excess of water in the blood, and guarding it against the consequences of those vicissitudes of temperature we are constantly exposed to, and which, without such a protection would speedily destroy life, by the depressing action of cold, at one time, and the exciting effects of heat at another. By the wise provision of nature in constructing the skin, we can bear the intense cold of a northern winter, or pass, unscathed, over burning sands, under the vertical sun of the Line. Men live and enjoy good health in the Arctic regions where spirits of wine are frozen, and glass-blowers and those employed in iron-works are in the regular habit of working at a temperature of 360 deg. Chaubert, the fire-king, had his furnace heated sometimes as high as 600 deg., and remained in that heat while a joint of meat was cooked beside him. The animal heat is preserved in the one case, and the inevitable fever prevented in the other, by this property of perspiration. It becomes more abundant and perceptible when the body is in exercise, or exposed to a high temperature, and is termed *sensible perspiration*, but never ceases even when the body is in a state of perfect rest, although it is then so limited in quantity as to be imperceptible, and is called *insensible perspiration*. These relative conditions of observable perspiration depend, however, not merely on the quantity of perspired fluid, but also on the dry or moist state of the surrounding atmosphere, —the former carrying off the fluid as rapidly as it is exuded, while the latter being already charged with moisture, is incapable of retaining any more—so that all other circumstances

of activity and temperature being the same, sensible becomes insensible perspiration, and *vice versa* just as the air is dry or moist. The quantity of matter thus carried off by the skin has been variously computed, and varies in individuals according to the state of the general circulation. Lavoisier calculated it at eleven grains per minute, which will amount to thirty-three ounces in twenty-four hours, of which of course a large proportion is water, about one per cent. being solid matter.* Every one knows the relief afforded during fever by a copious perspiration, the grateful change from burning thirst and restlessness to calm and cool repose; and the effects of checked perspiration in preventing the escape of these deleterious matters from the circulation are well known as the exciting cause of a great majority of acute diseases. As already stated, any interruption to the free performance of this function increases by so much the labour of the internal secreting organs, viz.: the liver, the kidnies, or the lungs, disturbing in a greater or less degree, their equilibrium, and frequently producing disease in them. Every one who values the happiness of his fellow creatures, must rejoice at the establishment of so many baths, and the provision thereby made to afford the working classes the means of keeping this organ in health. Personal cleanliness and domestic comforts are now universally acknowledged to exert a powerful influence over the morals and habits of the people, and therefore it is pleasant to see reform beginning at the right end.

The skin is composed of two layers perfectly distinct in their structure, and each performing a separate action in the economy. The scarf or outer skin is intended as a protection to the deeper seated layer,—the *dermis*, or true skin, and has been found to be composed of albumen, the same as the dried white of egg, which is soluble in alkalis. Soap which ought always to be used for the purpose of cleansing the skin, is composed of an alkali and oil, the former being in excess, and

* Seguin ascertained that the skin exhaled in 24 hours—

Organic matter	107·47	grains.
Saline matter	81·92	,,
Water and volatile matter	15750·61	,,
	15940	,,

this uniting with the oil of perspiration bedewing the skin forms a sort of emulsion, with which a portion of the adherent covering is removed, and the process being repeated the whole is cleared away. Every fresh application wears down so much of the surface of the scarf-skin, that at last it becomes painfully sensible to impressions which formerly would have been disregarded,—as in the hands of washerwomen after a hard day's scrubbing. It forms an accurate cast over the sensitive skin, following its various convolutions and turnings, and by being thicker in those places most exposed to bruises and pressure, prevents numerous accidents which otherwise would be productive of great pain and constant inconvenience. It is this skin which is removed by a blister, or scalds, and very few are ignorant of the pain which a simple current of cold air passing over a surface thus denuded will produce. The difference of colour in the various races of mankind lies in the deeper-seated and newly-formed layers of this structure.

The *dermis* or true skin is admirably adapted by its anatomical formation for the duties it is required to perform. It is the part by which sensation and the knowledge of external impressions is conveyed, and it is the organ which affords defence to the deeper parts of the body. We find that it varies in thickness on different parts of the body according to the pressure to which they are exposed, and that besides the investing scarf skin externally, it is still further protected from injury by the soft elastic cushion of cellular membrane on which it rests. Nerves and blood-vessels are extensively distributed over its surface—in fact these form so perfect a network that the finest needle cannot be inserted in any part without causing pain and bleeding, shewing that both nerve and blood-vessel have been injured. The capillaries, or intermediate vessels which convey the blood from the arteries to the veins form a most important part of its composition. The varying colour of the skin in the same individual depends on the gorged or empty state of its capillaries, and the rapidity with which the circulation through them is carried on. The act of blushing from some mental emotion or unexpected excitement is caused by the sudden rush of blood through the capillaries in the face and neck; while the pallor which ac-

companies fear and sometimes anger depends on the contraction of these vessels forcing the blood inwardly. The blue colour of the skin, observable in cold weather, depends in the first place on the depression of the nervous system, and the consequent languid movements of the blood through these intermediate vessels. This condition is still farther illustrated by the blue colour of the skin observed in the most severe cases of the collapse stage of Cholera, and the dismal tint assumed by noses generally rubicund, when exposed to the bitter bitings of a North-Easter. It appeared necessary to offer these brief explanations of the composition and structure of the skin in order that my readers may be able to understand the full importance of bathing and the manner in which it acts in the preservation or restoration of health.

In speaking of baths it is better to state at once that the terms *cold*, *cool*, *tepid*, *warm*, and *hot*, are merely relative—that the sensation depends entirely on individual susceptibility; that what is tepid for one person is hot or cold for others, and even for the same person under altered circumstances of bodily temperature or health. That temperature which would be agreeable to a person in good health, feels cold when he is suffering from the rigor of fever. The thermometer, therefore, affords us only a partial guide in defining and applying these terms to different temperaments. We will take water at the ordinary temperature of spring water, and point out its effects on the body, and then enquire how far the increase of temperature and other circumstances influence the operation of the natural springs of Buxton both in health and disease.

The sudden application of cold water to the whole surface of the body produces what is called a shock, and for a moment one of the most powerful sensations that can be experienced. The blood is driven from the skin—the capillary vessels, minute arteries, and veins are contracted—the heat of the surface of the body is abstracted, and the perspiratory process suspended. If the immersion be momentary, the natural state of the vessels is soon restored, but if the body is retained long in the cold medium, the internal vessels become loaded, the skin shrinks and becomes pale,—an unpleasant load rests

on the chest—the breathing becomes difficult and gasping—the pulse is lowered both in frequency and force—the animal heat is diminished—cold, shivering, and sometimes cramp in the limbs occurs—and if the immersion be continued, all these symptoms are aggravated, with great depression of the nervous power. In strong constitutions what is termed *re-action* takes place very speedily after immersion, and in the water, but in others, who are weaker, it only occurs satisfactorily after a very short contact, and sometimes requires other means, such as heat and friction to restore it. In re-action the blood returns to the surface,—a general glow of heat and comfort pervades the whole frame—the circulation is more energetic—the load taken off the internal vessels renders the respiration easy—the temperature is increased—perspiration goes on more briskly—nervous power is increased—the whole body is buoyant with recruited energies, and the mind and spirits partake of the general excitement. Individuals who accustom themselves to the use of the cold bath frequently require to extend the duration of immersion before re-action is established, but when by using muscular exercise, it does take place, it is more satisfactory and decided. Sometimes, if the water be much colder than the skin, or if the bath be too long continued, re-action becomes too violent, and instead of the agreeable glow to which I have referred, shivering, head-ache, and other symptoms of fever or local congestion follow, and much mischief may result. In order that these effects of cold bathing may be fully and agreeably realized, it is necessary that the surface of the body should be of a moderate temperature at the time of immersion; neither depressed by cold, nor over excited by exercise. Although, in my opinion, the danger of cold bathing when in a state of perspiration has been most absurdly exaggerated, still as this *brochure* is intended for the invalid, I cannot say that I would recommend its indiscriminate practice. The stout and athletic may pursue it without inconvenience, but it is only in a very few cases of disease that its practice could be suffered. The tepid or warm is a most agreeable method of using the bath,—it exerts a soothing influence on both body and mind—softens and relaxes the skin—increases perspiration—excites

the capillaries to greater activity—draws the blood from internal organs to the surface—calms the circulation—subdues nervous irritation—and produces the most agreeable and refreshing feelings of comfort and satisfaction. When the temperature is much above blood heat, 98 deg. of Fahrenheit, it excites and disturbs the circulation—the skin becomes red and swollen—the arteries conveying blood to the head throb violently—the face becomes turgid—the eye inflamed,—and the excited circulation through the brain soon shews its effects on that organ, and would produce apoplexy if the cause were continued. Where the bath is thus abused, the person on leaving it feels weak and exhausted—the whole mental and bodily powers are sunk—the pulse continues quick—there is noise in the ears, and head-ache, which are only relieved by rest and copious perspiration. A temperature about, or of four or five degrees above, blood heat will be found the most agreeable, and will be borne longer than one much above or much below that standard.

A strong prejudice exists that the body is rendered more liable to be affected by cold after a warm bath, and that it weakens and enervates the system. The very reverse is the case. The skin is better able to perform its function from having had its extreme vessels cleansed and rendered more fit for exhaling the secretions; and the practice in Russia of rolling among snow after a warm bath, is at once in accordance with theory and experience. The skin is braced and strengthened, and more capable of resisting the depressing influence of cold. In many cases it is advisable that the relaxed state of the skin vessels produced by a warm bath should be kept up, and perspiration encouraged by additional clothing or a higher temperature, but this is only done for a specific purpose, and not from any fear of bad effects from its suppression.

There is one property of the skin to which I wish to draw attention, as on it depends entirely the *modus operandi* and efficacy of bathing in water impregnated with gases, salts, or other ingredients;—and that is, its power of ABSORPTION, or introducing into the system substances applied to its surface. That the skin does possess this property is evident from the

relief for thirst which shipwrecked persons experience by bathing in salt water, instead of drinking it—from the active manner in which mercury and other substances affect the system, when introduced into it through the skin by friction, and from the curative effects exerted by bathing in water holding various medicaments in solution, or by sulphur, &c., when applied in a state of vapour. The scarf skin, when bedewed with its oily secretion, interferes materially with this power of absorption, and fortunate it is for mankind that it is so, otherwise we should be in constant danger of being poisoned by noxious gases, and other deleterious agents finding their way into the system through its means. The extent of surface presented by the lining membrane of the lungs to the action of miasmata, is sufficiently dangerous without increasing so serious an evil by the extensive surface of the skin acting also as a constant absorbent. If the fluid in which the body is immersed is warm, or impregnated with alkaline particles, or if these are combined, the scarf skin becomes softened, and its oily secretion neutralised, so that its absorbing powers are increased in activity, and this explains the action of salt water already mentioned, and the manner in which the Buxton and other mineral waters exert so powerful an influence on the system. Were the scarf skin to remain in its naturally hard or well-oiled condition, bathing would be of very little avail in any case, as it would offer an effectual resistance to the transit of any substance beyond its surface. When we wish to introduce substances which are known to disagree with the stomach, so as to have the full benefit of their agency, we remove a portion of the scarf skin by a blister, and sprinkle them on the sensitive layer, where the process of absorption goes on very briskly, and we find their action quite as powerful as when administered by the stomach. The action of medicinal agents when absorbed through the scarf skin is weaker and slower, but not the less secure, if their temperature and composition be in accordance with the condition stated above. Instances are on record in which persons have had their lives preserved by bathing in warm milk, when the stomach has been so irritable as to refuse food of every kind, or when the passage between that

organ and the mouth has been impervious, and the nutritive principles of the milk passed at once into the circulation, without undergoing the process of digestion. The warmth relaxed the skin, converting it into an absorbing organ. The same thing occurs in using the hot spring here, with the additional effect of its alkaline properties on the oil by which the skin is bedewed, adding greatly to its activity.

CHAP. II.

THE BATHS, SITUATION, &c.

Buxton is situated in the north-west part of Derbyshire, in the hundred of the High Peak, and has long been resorted to on account of the medicinal properties of its hot springs. The surrounding country contains some of the boldest scenery in England, and affords proof of having been at some remote period the scene of some of those violent convulsions in the bowels of the earth which disrupt mountains, and totally change the external aspect of the region. The town is situated on the banks of the river Wye, not far from its origin in the lime strata near Poole's Hole, and is now known as Upper and Lower Buxton—the former being the original village of considerable antiquity, and the latter comprising the Crescent, The Square, and Spring Gardens, of comparatively recent erection, and built entirely with the view of affording additional accommodation to invalids and their friends. The principal hot springs,—the staple commodity of Buxton,—issue from the limestone in the immediate vicinity of The Crescent and The Square, at a perfectly unvarying temperature, a little above 82 deg. of Fahrenheit. During the last winter, which was of unusual severity and long continuance, I repeatedly tried, but never observed the slightest variation in either quantity or temperature, and on several occasions the thermometer was 18 and 20, and once 41 degrees below the freezing point out of doors. The water is poured out from

a number of fissures in the black limestone, and the supply has been calculated to be at the rate of sixty gallons a minute, although other authorities have rated it much higher. There are in all seven baths,—three for gentlemen and two for ladies, beside the two Baths for poor bathers. The gentlemen's public bath is immediately over the springs, in an arched room, 30 feet long by 17 wide, to which a commodious dressing-room is attached. The bath itself is 27 feet long by 12 feet 8 inches wide, but at one part it has been narrowed by a reservoir taken from it to collect water from a very powerful spring to supply the adjoining baths. The sides of the bath are lined with gritstone, and it is furnished with stairs at each end,—a rod of iron running round it, and chains from the roof for the invalids to lay hold of,—a crane and chair for the accommodation of those who are so helpless as to be unable to descend by the stairs,—and a forcing pump, which can be regulated as a *douche*. The bottom of the bath is paved with gritstone, through the joints of which the water and bubbles of air are constantly arising, except in two places, where the black limestone reaches the surface, and has been levelled down, through which two strong springs flow. The average depth is 4 feet 11 inches.

The next bath, and entered to from the same passage, is the gentlemen's private bath, or "Duke's Bath," contained in a small room, with a dressing-room attached. It is of an oval form, lined with grey marble, 10 feet 6 inches by 6 feet, and about 4 feet 10 inches deep when filled. Like all the other baths, it is fitted up with a douche, and other requisites for invalids. The temperature is 81½.

The other Bath, generally known as the "Gentleman's Two Shilling Bath," has been built about forty years, and is a most commodious and convenient bath. It is contained in a lofty, well lighted room, and is 22 feet 10 inches long by 10 feet 10 inches wide, and, when filled, the water is 4 feet 10 inches deep. It is lined round the sides and bottom with white marble, and is fitted up with douche, &c. Adjoining it are two dressing-rooms, each admitting to the bath by a stone stair, the intention being that only one person shall bathe at a time, one being occupied in dressing while the other

is in the water. It is supplied through pipes from the reservoir already mentioned near the public bath; and from the quick rate at which it flows, it is not more than two degrees lower than the public bath. The very trifling loss in temperature, and the absence of the bubbles of gas, have excited a great prejudice against the efficacy of this bath, which experience has convinced me to be perfectly unfounded. Indeed, if these objections were at all valid, we could not expect cures to be effected in any of the other baths which are at a greater distance from the spring than even this bath, and yet the strongest proofs of the virtues of the Buxton Waters are to be met with in the two Charity Baths, where the proportion of cures to cases is an annual subject of wonder and gratification.

The effects of the Buxton Thermal Waters, as we shall shortly explain, seem to depend entirely on the quantity of nitrogen gas held in solution, and so long as the water retains, within even ten degrees, the temperature at which it issues from the spring, any diminution of the quantity of gas is imperceptible, and of course the virtues of the waters are unimpaired. It is certainly more agreeable to bathe in the water as it issues from the rock, if a person can have the bath to himself; but during the season, when so many are using it, such a luxury is nearly impossible of attainment, but as far as efficiency is concerned, it is satisfactory to know that one may be resorted to with quite as much confidence as the other.

The Ladies Baths are two, the public one 22 feet by 12, and the private one 11 feet by 4. The former is partly supplied by a number of small springs rising through the pavement, and partly from the reservoir already mentioned. The latter bath is entirely supplied from the reservoir. Their temperature is a shade below 82.

The Charity Baths are in a yard adjoining the Ladies' Bath—one for men, and another for women. They are about three degrees colder than the bath over the spring, but this in no way interferes with their efficiency. In addition to powerful douches, there is the requisite apparatus for the preparation of a hot bath, the use of which is often absolutely

necessary to prepare patients for receiving the full benefits of the natural waters.

"The Hot Baths" are situated at the other end of the Crescent, near the Great Hotel, and are fitted up with every requisite comfort and convenience. The water which is used in them rises from a spring near the centre of the Crescent, and is of the same composition as the water of the Natural Bath. It is passed through pipes round a boiler, by which any temperature can be obtained, without interfering much with the arrangement of its component ingredients, although the additional temperature up to a certain point, modifies its action on the system, and renders it much less stimulating than when the water is used at the natural temperature. It is generally found necessary to prepare a person for the Natural Bath by the use of a few of these baths, gradually reducing the temperature at each time of bathing. In one of the rooms there is a Shower Bath which can be made of any temperature, and the requisite apparatus for a Vapour Bath, the existence of which was unknown to me till last season. It is one of the most valuable adjuncts in the cure of obstinate rheumatism and other chronic disorders I have ever tried. I have used the vapour as high as 150 degrees of Fahrenheit, and, with proper arrangements for free respiration, have never seen any but the most beneficial effects. Some cases which had resisted all previous treatment, and a free use both of the Hot and the Natural Baths, yielded to one or two moderately extended Vapour Baths. The extraordinary character of the perspiration in these cases showed why every other less effectual method of cleansing the skin from its impurities had so signally failed.

There is another bath in the fields on the road to Poole's Hole of the same temperature as the Matlock Bath, viz., 62°. It is supposed that the temperature is originally the same as that of the springs lower down the valley, and that the reduction is produced by the water finding its way through a higher stratum, and becoming mixed with land springs. This field bath has lately undergone a thorough repair, and is now a most agreeable plunge bath. It is of service in some cases wherein the use of the warmer baths would be injurious.

The Well is a neat Grecian building, opposite St. Ann's Hotel, and the water in its transit thither from the spring on the other side of the road loses several degrees of temperature. The water is supplied by four women appointed for the purpose, to whom the gratuity usually bestowed is a consideration. The composition of the water in the Well is exactly the same as at the Baths; and in some cases, where the stimulating effects of bathing are too great, drinking the water has been found of the greatest benefit. It has a mild, insipid taste, though not so vapid as ordinary water at the temperature of new milk.

On the Manchester road, at the back entrance to the George Hotel, a spring of chalybeate water flows, known as "The Lion's Mouth," containing a small proportion of the protocarbonate of iron in solution, at the ordinary temperature of spring water. It is a most valuable addition to the Buxton Springs, and every year affords proofs of its efficacy as a gentle tonic, often agreeing with those constitutions, where the use of the hot spring is contra-indicated, or has been found to disagree. Its taste is sweetish and chalybeate, and not so unpleasant as "Iron Water" generally is. The dose is about the same as the Hot Spring, and similar rules must be observed by invalids in drinking it. In some disorders, to which females are peculiarly liable, this chalybeate, combined with occasional tepid baths, is very beneficial. Formerly the access to this fountain was difficult for invalids, having to cross the Manchester road, always crowded with conveyances of various kinds—and in wet weather very dirty and uncomfortable. These drawbacks have now been obviated, and a handsome temple, supported on iron pillars, has been erected, from the centre of which the water flows, and is supplied at a very moderate charge. The adjoining garden has been thrown open to the visitors.

CHAP. III.

ANALYSIS OF THE WATERS, &c.

The chemical subdivision of mineral waters into their component ingredients has very rarely been sufficient to account for their effects on the human body. The quantity of salts, or other solid matter, found in them, is generally so minute as to leave investigators completely at fault in trying to assign reasons for their powerful agency, and we need not wonder that the homœpathists have laid hold of this fact as one of their strongest arguments. If this is the case with water containing salts, &c., with whose action, when given in larger doses, we are acquainted, how much must the difficulty be increased when we are investigating the effects of a gas on the human system, as in the case of the Buxton Waters?

An old writer on Mineral Waters observes—"Many books have been published on the Mineral Waters; some of them with much ingenuity; but they are chiefly employed in ascertaining the contents of them by chemical analysis. This, no doubt, has its use; but it is by no means of such importance as is generally imagined. It is possible for a man to know the analysis of the whole *materia medica* without being able to apply a single article of it in the cure of diseases." Although geologists have of late years directed their attention to the formation of hot springs, and have propounded more reasonable theories than formerly existed, to account for their variety of temperature and other circumstances, yet their investigations have not been conclusive enough to disprove or throw more light on the opinion entertained by a writer on this subject nearly a century ago, who observes—"There are beneath the surface of the earth divers mineral substances; some fixed, some volatile; some in the form of hard,

some of soft bodies, and some of fumes; to many of which learned men are strangers; besides such which, though they may have been accidentally seen, have their nature so little known, that names even have not been given them. Considering, then, the many ingredients with which we are unacquainted, that the proportions in which they are mixed may be numberless; and that the qualities resulting from these commixtures may be different from those of the ingredients in a separate state; the difficulty of determining, *a priori*, the effects of Mineral Waters appears to be almost insuperable."

Until the investigations of Dr. Pearson, more than half a century ago, the gas which bubbles up with the water at the spring was suspected to be carbonic acid, from its properties of not supporting combustion and respiration, and also from that gas being usually present in common water, but never absent in water springing from, or near, limestone. His experiments led him to the discovery that it was a very different gas, viz., nitrogen, and all subsequent analysis have confirmed the truth of his discovery. Although these gases resemble each other in their negative properties, both being incapable of supporting combustion and respiration, yet in their positive action, and in their combinations, they are widely different. Since its discovery it has been the opinion of all writers, that on the presence of this gas the virtues of the Buxton waters entirely depend, but until very lately the explanation of this admission has not been attempted. The modern School of Chemistry founded by the great Liebig, and boasting of such men as Fresenius, Gregory, Lyon Playfair, Wilson, Kemp, Bowman, Bullock, Fownes, Fyfe, &c., most of whom received their inspiration at the Laboratory of Geissen, has now enabled us to explain their *modus operandi* as readily as we can that of any other chemical action in organic or inorganic life.

A great number of examinations of the chemical properties of the waters have been made at different times, but I shall not take up space by referring to any but the last, published by my friend, the late Sir Charles Scudamore, in which he was assisted by a very able operative chemist, Mr. Garden, of Oxford-street, London, as it comes more closely up to the

chemistry of the present day, from their having had advantages in the manipulations not enjoyed by their predecessors.

CONTENTS OF A GALLON OF WATER AT 82 DEGREES OF FAHRENHEIT.

Gaseous Contents.	Cubic Inch.
Carbonic acid	1·50
Nitrogen	4·64

Solid Contents.	Grains.
Muriate of magnesia ...	·58
„ of soda	2·40
Sulphate of lime	·60
Carbonate of lime... ...	10·40
Extractive matter and a minute quantity of vegetable fibres	·50
Loss	·52
	15·00

A single glance at the above table will be sufficient to convince any one that we must look to some other source than the solid contents for an agent so powerful in its effects as we know these waters to be possessed of. The largest quantity of a salt they contain,—the carbonate of lime, combined with the muriates of magnesia and soda, will partly account for their antacid and tonic action, but we cannot conceive how these could exert the rapidly invigorating effects which follow their administration in cases of debility unaccompanied with fever. That nitrogen does produce this effect is now known to all chemists, and the kind of food containing the greatest per centage of this principle is now recommended as the best adapted for invalids and children. The chief agent in nutrition is proved to be nitrogen, and therefore we cannot doubt but that the introduction of so much of this gas into the system, in drinking the water, and through the skin, which I have shewn to be an organ capable, under favourable circumstances, of absorbing largely the constituent parts of warm alkaline water in which it is bathed, must very speedily exhibit its stimulating effects in bodies weakened and reduced by disease and suffering. I have satisfied myself that in the ratio in which the excretions exhibit their normal proportion of nitrogen the restoration to health proceeds, and that if from any irregularity, or accidental circumstance, this re-

turn to a duly proportioned condition of the fluids is interrupted, so is the progress towards renovated strength suspended. It would lead me into a lengthened and minute chemical investigation, not at all in accordance with the design of this book, were I to give the various experiments and observations which I have made on this subject, and which have confirmed me in this opinion. I must therefore content myself at present with a mere statement of the fact, that the nitrogen of the Buxton Waters—a principle of which they possess the monopoly among mineral springs,—is quite sufficient to account for the powerful effects, beneficial or prejudicial according to circumstances, from which they have acquired their fame.

The subject is a most interesting one, but its complete elucidation would require more space than I can devote to it here. It is, however, satisfactory to know that the very agent which chemists have now proved to be indispensible to the fulfilment of perfect health, and for which they have searched amid the various kinds of animal and vegetable food, is here poured out in unlimited quantity from the laboratory of Nature herself, and that the invalid, in whose case an extra supply of the reinvigorating principle is required, has only to wash and be healed. The very simplicity of the means is the strongest argument in its favour, for it can be obtained unadulterated with any other deleterious matter. Patients have often been surprised at the strength which seemed to return to them at once when in the bath, and have been at a loss to account for it. The apparent difference between this and ordinary water at the same temperature was so insignificant, that till they proved it they could not believe it, and when they realized the effects they wisely concluded that it must depend on some principle not possessed by other water, —and this is the principle, supplying the very ingredient required, and restoring at once the equilibrium of the vital forces, which could only be effected slowly in the usual course of digestion and assimilation. It might be a question whether the introduction of a larger quantity of nitrogen would increase the powers of the waters, and the experiment may be made, but at present I am quite convinced that Nature has

furnished us with a sufficiently active supply for most cases, and I am contented with it.

The invalid resorting to Buxton derives considerable benefit from many collateral circumstances, some of which will apply equally to all watering places, while others it possesses exclusively. Change of air, change of scene, change of society, change of habits, relaxation from business, the attention being solely occupied with the prospect of cure, and all the energies directed to that one point must produce a beneficial effect. If the usual residence is in a town, or in a flat part of the country, the elevated position of Buxton, and the bold and varied character of the surrounding scenery must exert a stimulating and rousing influence on a mind prostrated by protracted suffering, and hope and cheerfulness will at once supplant dissatisfaction, lassitude, and sometimes even despair.

Those whose lungs are not in any way affected are at once sensible of an elevation of spirits, a load appears taken off them, and the fresh air is an agreeable substitute, under any circumstances, for the smoke and dirt of our manufacturing towns. The appetite improves, "tired nature's sweet restorer, balmy sleep," comes uninvited by drowsy syrups, and the morning finds them refreshed and vigorous. With these valuable sanatory adjuncts, the Buxton waters frequently succeed in effecting cures in the obstinately chronic cases that have withstood the most scientific application of the varied resources of the materia medica. So powerful a remedy ought of course to be employed cautiously, and even those who are in the enjoyment of robust health cannot use these waters indiscriminately without suffering for their imprudence. Their effects vary according to the differing temperament and constitution of individuals in the same way as has been observed of other active medicinal agents. For instance, a dose of opium, while its general character is to induce tranquillity and repose, in certain constitutions is followed by delirium or convulsions, while in others it is totally inert. And while a small dose of mercury will occasionally salivate a very strong person, another, to all appearance far more delicate and susceptible, will continue its use for a long time, without showing the slightest symptom of being affected

by it. These various effects of such powerful remedies prove how much the temperaments of individuals influence the operations of external causes on the general system, and experience shews that what is useful as a remedy to one person may to another be useless or prejudicial. To attempt, therefore, to lay down one unvarying rule for the administration of these waters, is perfectly absurd, as their effects on invalids must be influenced by so many different causes of temperament, duration of disease, previous mode of treatment, condition of organs and tissues, &c., and even when all these are ascertained, the curative process established by them must often be carefully watched and regulated, so as to guard against exhaustion on one hand, and over-stimulation on the other. General rules may be laid down as to the proper time of the day for using the bath and drinking the waters, the frequency with which these may be repeated, and the best course to be pursued after bathing, and in regard to diet, exercise, &c. ; and that is about the extent to which even the most elaborate treatise could safely go.

The discovery of the virtues of the hot springs of Buxton is unknown, but we can trace their fame so far back as to make it clear that their powerful effects were known more than three centuries ago. The destruction of St. Ann's Chapel by the Lord Cromwell, on account of the relics and votive offerings hung round it in the shape of crutches, &c., by the lame who had been healed, in proof of their gratitude to the presiding saint, shews that their virtues were extensively known at the time of the Reformation, in curing those very diseases in which their efficacy remains unimpaired to the present day. During that time great changes and revolutions have taken place in the healing art ;—new theories of disease, new views of physiology, and new modes of treatment have been adopted by succeeding generations, and superseded by others which have also passed away in their turn: yet Nature has remained the same, and whatever difference in the character and modification of disease may be attributed to civilization, this fact at least is clear, that the lame who resorted to Buxton, previous to the reformation, were, in many instances, enabled to hang up their crutches in testimony of

their cure, and that the same effects are produced every season now.

From what has been already observed of the invigorating effects of nitrogen, we may infer that cases of debility and relaxation of fibre are the best adapted for a course of these waters, and we find that in certain forms of dispepsia or indigestion, proceeding from intemperance, or an inadequate supply of nervous energy, from the mind being harassed with anxiety or the cares of life, and which are attended with loss of appetite, langour, flatulence, disinclination, or incapacity for business, and that sort of morbid aversion to society by which this protean malady is distinguished, generally are speedily and permanently relieved by a judicious use of the waters. The first effects may not be very encouraging—the patient may be annoyed by distention of the stomach and headache after drinking the water, or diarrhœa may occur, but unless these go on to a great extent there is no cause for alarm. A little aromatic tincture, as of ginger or cardamoms, or, what I usually recommend, a glass of brandy and hot water without sugar, is all that is required to counteract these disagreeable symptoms. This relaxed condition of the bowels is generally looked upon as a favourable symptom in such cases, particularly if it be unaccompanied with pain, a sense of debility or faintness, as it seems to arise from a more healthy and stimulating state of the secretions concerned in digestion. We have, therefore, none of the nausea and depression usually accompanying such a deranged state of bowels, but, on the contrary, increase of appetite and an elevation of strength and spirits. The soothing and detergent effects of the water when taken internally, in proper doses, acts most satisfactorily in those cases of indigestion where the quality of the bile and the other juices has become acrid and irritating, and where drastic purgatives only afford a temporary and variable relief. "The tenacious soapy bile," whose morbific effects are so graphically described by Dr. James Johnson as the cause of some of the most frightful forms of dyspepsia, is speedily altered in quality, and effectually carried off, by which the corresponding train of symptoms is relieved and removed. Those who have written on the cold water

treatment, absurdly named "*hydropathy*," tell us that the common spring water will produce similar good effects. I do not doubt it in the least; but the temperature of the Buxton spring, and its peculiarly stimulating, yet soothing, properties act far more speedily and efficaciously, particularly if the rules regarding diet, early hours, exercise, and abstemiousness enforced at these establishments are at the same time observed, which the practitioner here cannot always be sure of. The condition thus relieved is fully described by Dr. Johnson in his "Treatise on Indigestion." He says:—

"The term 'blue devils' is not half expressive enough of this state; and if my excellent friend, Dr. Marshall Hall, meant to describe it under the head of '*mimosis inquieta*,' he never experienced it *in propriâ personâ!* This poison acts in different ways on different individuals. In some, whose nervous systems are not very susceptible, it produces a violent fit of what is called bilious colic, with excruciating pains and spasms in the stomach and bowels, generally with vomiting or purging, which is often succeeded by a yellow suffusion on the eyes, or even on the skin. Severe as this paroxysm is, the patient may thank his stars that the poison vented its fury on the body instead of the mind. Where the intellectual faculties have been much harassed, and the nervous system weakened and rendered irritable, the morbid secretion acts in that direction, and little or no inconvenience may be felt in the real seat of the offending matter. The mind becomes suddenly overcast, as it were, with a cloud;—some dreadful imaginary, or even unknown evil, seems impending; or some evil of trifling importance in itself, is quickly magnified into a terrific form, attended, apparently, with a train of disastrous consequences from which the mental eye turns in dismay. * * * * I believe such a train of symptoms seldom obtains, except where there has been a *predisposition* to morbid sensibility, occasioned by mental anxiety, vicissitudes of fortune, disappointments in business, failure of speculations, domestic affiictions, too great labour of the intellect, or some of those thousand moral ills which render both body and mind so susceptible of disorder.

"In some constitutions, especially when there has been gout in the family, or some hereditary disposition to disease, these attacks of vitiated secretion in the glandular organs of the digestive apparatus seemed almost necessary from time to time to clear, as it were, the constitution, like paroxysms of gout itself. It is hardly possible, in such cases, to prevent entirely the recurrence of these storms, even by the strictest attention to diet, regimen, and medicine; but if these precautions are not taken to restrain

the violence and lengthen the intervals, the attacks become dangerous, and derangement of function may ultimately end in disease of structure. On this account people should not consider their temperance and vigilance as thrown away, because these periodical visitations cannot be entirely prevented by the most skilful physician."

In entering on a course of these waters, such cases often require what is called a preparation, provided they have not been under medical treatment immediately before coming here. A mild mercurial, as Plummer's pill, or mercurialized chalk, combined with extract of hyosciamus, taken in the form of a pill at bed-time, with an aperient draught of Moxon's Effervescent Magnesia, or infusion of rhubarb with tartarised soda and tincture of Cardamoms, next morning, is usually sufficient to enable the stomach to receive the water without its producing any disagreeable symptom. The great majority of cases require little more medicine during treatment, unless where constipation occurs, and then a common warm aperient pill, such as is prepared by the druggists, entirely free from mercury in any form, or one composed of equal parts of compound extract of colcynth and extract of rhubarb, is all that is necessary. Occasionally where the nervous system is much exhausted, as has been the case of late years from the tremendous extent of speculation into which so many were led, the first agreeable effects are of short duration, and the exhilaration is followed by exhaustion of spirits, an indolent condition of the secretions, and the patient is apt to indulge in melancholy prognostications of his state. But these symptoms are simply the consequence of the previous nervous exhaustion, and are speedily alleviated by the exhibition of a gentle tonic in combination with a moderate use of the waters, and a rigid observance of proper rules for diet and exercise. These two last items in the treatment cannot be too much nor too often insisted upon, as it is absolutely impossible for any remedy to alter and improve the state of the secretions of the digestive apparatus, unless the consumption of every article likely to derange them is carefully avoided. "Many a happy and lucky thought has sprung from an empty stomach—many an important undertaking has been ruined by a bit of undigested pickle;" and many a good prescrip-

tion has been baulked in its effects from the same cause. Patients affected with this malady should endeavour, in the first place, to leave business and its anxieties behind them, and then, having cleared out the *prima viæ* in the manner recommended, and rested a day or two to overcome the fatigue of travelling, and get accustomed to the change of air, they should begin with a warm bath at 98 deg. of Fahrenheit, and repeat it twice on alternate days, reducing the temperature two degeees each time, so that the last bath may be 94 deg. The water may be drank at the same time, beginning with half a pint, which should be taken at twice, one-half, an hour, at least, before breakfast, and the other half in two hours after that meal, and the quantity should be gradually increased to a pint, provided no symptoms arise to contra-indicate its use. A larger dose than this is scarcely ever necessary, but when it is, the interval between luncheon and dinner, or when this meal is taken early in the day, three hours after it, is the best time for taking another half-pint, and this quantity is generally found to be as much as the stomach will bear advantageously. Exercise should be taken before and after drinking the water, in order that it may be distributed through the system as speedily as possible. In a day after the last of the specified number of hot baths, the natural bath should be tried with the precautions pointed out under the general rules for bathing, and repeated every second day, or more or less frequently, according to its effects. It should always be borne in mind that the very utmost which art can accomplish in the cure of disease, is to induce Nature to assume a healthy action, and to regulate the reparatory process thus instituted; stimulating it when too languid, and modifying and curbing it when too energetic. It is unreasonable for persons who have been invalids for years to expect an immediate cure, or that the first very agreeable impressions will become more vivid and permanent every day, particularly in those cases in which the nervous power has been impaired by intemperance, or wasted with corroding cares. "Patience and perseverance" should be the motto of every one who seeks to rescue his future life from the miseries attendant on this condition, and the slightest amendment may, in nearly all cases, be looked

upon as denoting a power in the constitution sufficient to shake off the effects of those ruinous agencies to which it has so heedlessly, and often so needlessly, been subjected. The good effects resulting from the use of the Buxton Waters in this class of complaints, are observed in most others wherein nervous debility is one of the prominent symptoms. This term has become very common of late years, and though applied to a great variety of symptoms, is always indicative of a disturbance in that regular distribution of the nervous fluid, upon which the proper performance of their functions by the various organs so much depends. When it depends on spinal irritation, or is one of the consequences of congestion in the brain, and accompanying paralysis,—when in fact its presence is clearly referable to some lesion in the great centre of the nervous system, the utmost caution is necessary in using so powerful a remedy. But in the former disease, when the inflammatory action in the investing membrane of the spine has been subdued, and the principal remaining symptoms are one or more forms of hysteria, with occasional loss of power in the extremities, sluggish condition of all the secreting organs, and general want of tone, the effect of these waters is most satisfactory. A short time ago I had two patients under my care at the same time, in one of whom these symptoms were very prominent. There was loss of voice, incapacity for motion, the muscles which supported the body in the erect position had lost their power, frequent paroxysms of difficulty of breathing, threatening suffocation, constant head-ache, deranged condition of the stomach with variable appetite, pulse at the wrist sometimes as low as 50 beats per minute, and then rising suddenly to 120 or more, and a general emaciation of the whole frame consequent on two or three years of such suffering. With one or two drawbacks the case progressed favourably; in a few weeks the patient was able to take walking exercise, and after two courses of bathing returned home quite well. In the other case the symptoms were not so painful, but the patient was incapable of attending to any duties, or of walking up the smallest incline,—the general health had suffered very much. In this case also the improvement was most satisfactory,—perfect ease and free-

dom of motion being obtained, and the general system became comparatively strong and robust.

When nervous debility is one of the consequences of a stroke, as it is called: i. e., when it is the consequence of apoplexy, and is present along with the loss of feeling and motion in some of the limbs, the use of any stimulant must be very cautiously entered upon. But when the cause of irritation can be traced, and has been subdued, and when merely the loss of sensation or motion remains, a course of hese baths frequently succeeds in restoring the suspended function of the nerve affected. In combination with galvanism I have seen the very best effects produced in some cases of old standing.

The great majority of patients who now resort to Buxton are affected with rheumatism, gout, rheumatic gout (a term which will ere long become obsolete,) or their consequences, and there is little doubt but that its original fame as a watering place originated in its powerful efficacy in the relief of the first of these diseases which so often sets medicine at defiance. A recent writer on chronic rheumatism, after giving a list of remedies which have been tried and failed for the cure of this disease, honestly observes "a remedy of certain power is still a desideratum." The effects are most obvious in the consequences of the acute form of the disease, after what is known as rheumatic fever, leaving general debility of the whole system, and the loss of power sometimes in every joint. The recovery in such cases is usually rapid,—the restoration of sensation and motion occurring after the first immersion. When the chronic form of the complaint is of longer duration, and the joints have become enlarged from effusion or a thickened gristly state of the surrounding tissues, the good effects are more slowly manifested, but they are not the less certain, as the published yearly records of the Bath Charity show. Of course the cures are more rapid when the patients are young, but I have frequently witnessed a perfect restoration of patients considerably advanced in years; and many in whom little perceptible amelioration was observable at the time of leaving Buxton, have written the most favourable accounts of themselves on their return home.

In a variable climate like ours, persons of every age are subject to the attack of rheumatism, but those whose occupations expose them to the vicissitudes of the weather are more liable to be seized by it than others who have this world's comforts and luxuries at command. Colliers, farm labourers, and men engaged in manufactories artificially heated, constitute the greater proportion of male cases among the working classes, and the following abstract from my Bath Charity book will shew the relative ages at which they are attacked. Out of 546 cases, viz., 326 males, and 220 females, I found the following ages :—

Under 20		Between 20 and 30.		Between 30 and 40.		Between 40 and 50		Between 50 and 60.		Between 60 and 70		Above 70.	
M.	F.	M	F.	M.	F.	M.	F.	M.	F	M.	F.	M.	F.
17	13.	42	46	70	57	66	47	75	27	49	26	7	4

The oldest male was 75	The oldest female, 78
The youngest do., 16	The youngest do., 11

The majority of the female patients were house servants, charwomen, and factory girls.

If any remedial agent is entitled to be deemed a *specific*, assuredly these waters may lay claim to the epithet when properly administered in these painful and frequently intractable complaints. The various phases which rheumatism assumes, whether *lumbago*, *sciatica*, or *tic doloreux*, are equally under the control of this remedy, if the circumstances of the case warrant its use. When there is fever present, with a quick jerking pulse, and a furred tongue, the natural bath will do more harm than good. These symptoms must first be got rid of by medicine otherwise they will certainly be increased, and the patient disappointed in obtaining the relief which he was led to expect. An error in diet, or an occasional injudicious exposure to the weather, will sometimes produce such symptoms; and occasionally they occur even under the most cautious treatment, when it becomes necessary to cease bathing until they are subdued, and recommence with a warm bath as at first. Very generally increase of pain, but unattended with fever is a consequence of the bath, and is reckoned a favourable symptom. So far it is, as we cannot expect an alteration of diseased structure to be produced without some altered condition of the blood vessels and

absorbents of the part, and such an alteration is rarely unaccompanied with pain. The victims of this complaint not only require to exercise all their philosophy during the vehemence of its attacks, but also during the cure, as their sanatory progress is so liable to be interrupted and impeded by the most trifling causes, and their hopes of a certain restoration to health dashed to the ground, when they were apparently all but realised. But let them not despair, for experience warrants me in encouraging them to persevere even under the most disheartening circumstances. Where there is much effusion in the joints, or where the free play of the tendons is obstructed by an inflamed and thickened state of their investing membranes, the application of shampooing, or of galvanism, is almost indispensable to produce absorption, to stimulate the relaxed state of parts, and restore them to their natural state. The efficacy of the latter powerful remedy is only just beginning to be appreciated, and I have often known it to succeed when all other means had failed. It ought only to be applied by persons acquainted with its nature and the distribution of the nervous system. The pump, or douche, ought also to be had recourse to, beginning with, say thirty strokes, and increasing at each bath until it may be continued for four or five minutes. If the extremities are the parts affected, the douche may be used every day, both when the patient bathes and when he does not, as by protecting himself with Mackintosh the application can be confined to any part that may be desired.

The consequences of mercurialisation are under the control of these waters. When the system has been reduced, and the constitution almost ruined by repeated salivations, and when the blood seems saturated with mercury, the most happy results are produced by their use, joined to full doses of the Iodide of Potassium.

For many years, and before the continental mania set in, by which so many have been led to forget and neglect nearly all that was beautiful and good at home, Buxton was the fashionable resort for members of the higher classes and others afflicted with gout, and it was generally believed that its waters were not only efficacious in relieving the effects of

preceding attacks, but that they so strengthened the constitution, as to fortify it against the liability to a fresh attack for a considerable subsequent period. I have seen numerous cases, in which the annual three weeks' course of bathing, combined with that care in regard to living, which those afflicted with this disease learn to observe, secures immunity from any severe attack during the winter months, and in which an occasional omission has been certainly followed by months of suffering. The experience of these regular visitors attests not only to the immediate curative properties of the waters, but also to the production of certain changes in the constitution sufficient to overcome for a time the gouty diathesis. In young persons hereditarily disposed to this disease, and who have not aggravated their inherent tendency by any errors of diet or indulgences, the effects of a course of bathing are very beneficial;—the wandering pains assume a more decided and fixed character, the whole system is renovated and braced up, and such a change is produced in a few weeks as to render the life of the patient comfortable for years. In such cases from eighteen to twenty-four baths should be taken, beyond which number it is not advisable to proceed in any case. If more baths are required, a lapse of a fortnight should be made, as the debility which would result from taking a greater number would be sufficient to undo much of the good which had previously been produced. The usual course of bathing includes from twelve to eighteen baths, and it is only necessary in certain temperaments, and where the constitution is much affected to extend it beyond the latter number. In a disease which assumes so many varieties as gout, and which is so serious in its consequences, if improperly treated, it is impossible to lay down a mode of treatment which would be applicable to every case. So much depends on the duration of the disease and on the exciting causes, whether from indulgence or hereditary predisposition, and the treatment which has been pursued so modifies the symptoms, that every case presents some peculiar features which require to be treated separately. If the inflammatory stage has been subdued, and the various abdominal secretions restored to a healthy condition, the patient should commence

with one or two hot baths, and then have recourse to the natural bath, which should not be taken oftener than four times a week.

There are three principal points to be attended to by persons using the bath, viz., the hour at which it should be taken; the interval that should elapse between the times of bathing; and the length of time that is safe and proper to remain in the water. All remedies are liable to abuse, and of course the more active they are, the greater mischief will be produced by their improper application. It is very natural for persons who suddenly find relief, after, it may be, years of suffering, to suppose that if a limited immersion is attended with a little relief, an extension of it will be correspondingly successful. But this is a mistake, and I have seen several cases in which great mischief was done by such impatience. One season I was consulted by a man who complained of the inefficacy of the Buxton Waters, as he had been bathing for a week and was worse instead of better, and I was not surprised that it was so, when he told me that he had bathed three times every day, and remained in the bath from twenty minutes to half an hour each time. The feverish symptoms which this folly had excited were soon subdued, and he speedily recovered under a more gentle application. When the patient has rested for a day, to rally from the effects of travelling, and has made the most of his time by taking a little aperient medicine, to guard against a constipated state of the bowels which generally attends change of water and living, and provided there are no acute inflammatory symptoms present, he should begin with a warm bath at 98 degrees of Fahrenheit for ten minutes, which is to be repeated next day three degrees colder. A day should then be allowed to intervene, when the Natural Bath may be tried. At the commencement of the course, the best hour for taking the hot bath is an hour or two after breakfast, or in the evening, when the patient can retire at once to bed, which keeps up the action of the skin, and excites a moderate degree of perspiration, even in cases where diaphoretic medicines had been tried and failed. The best time for beginning with the Natural Bath is two or three hours after breakfast, when the

stomach has nearly performed its function on that meal, and the system is active under the nutrition afforded by it. If possible, brisk walking exercise should be taken before going to the bath, so that the skin may be warm, as the reaction is thereby more certainly and speedily produced. In describing the effect of cold water on the skin, I have described in what reaction consists, and although the shock from water at a temperature of 82 degrees, being only 16 degrees under blood-heat, is of course not so great as from immersion in cold spring water, yet it is quite sufficient to drive the blood from the surface, and produce a sensation of cold, and when the system has been greatly reduced by disease and suffering, the shock is as much as the patient can bear. In a few seconds the cold sensation is succeeded by a highly agreeable glow, more speedily obtained and increased by moving the limbs about to as great an extent as the patient can. The power of motion is often much greater in the water than the state of the patient out of it would lead us to expect, and both in my own case and in others I have found a cessation of pain, and a restoration of motion at the first bath. As much friction as can be borne without pain should be used to the part affected when in the water, and as soon as reaction is fully established, the patient should leave the bath, and have the whole skin well rubbed down with rough towels and Dinneford's flesh brush till it becomes quite red. When dressed, a comfortable degree of warmth should be experienced, and a lightness and elasticity of spirits, forming a great contrast to the previous lassitude and despondency. Life then, instead of being a burden, seems to open up fresh attractions, and all the powers, both bodily and mental, are invigorated and re-strung. The complexion becomes clear, the eye bright, the mental faculties are roused, and, what is perhaps the greatest sensible luxury of all, the skin becomes as soft as velvet, and as clean as an infant's. From the clearing of the cutaneous pores, and the excited state of the blood vessels on the surface, perspiration is easily induced, and therefore the invalid should be careful for an hour after using the bath. Not from any danger of taking cold when in that state, but for the sake of encouraging Nature in her efforts to get rid of these im-

purities by pouring them through such a channel. The best plan is for the patient to return to his lodgings and remain quiet for an hour or two. He should then turn out, if the weather does not prevent him, and take his second glass of water, (having taken the first an hour at least before breakfast,) and be in the air till dinner time. After the second Natural Bath a day's rest should be taken, and then proceed again at the same hour for two days more, and so on to the end of the course. The strength of the patient is generally the best rule to be guided by, and when the constitution has not been much impaired, or where the forenoon baths have been beneficial, and the patient's strength is returning satisfactorily, the bath may be used before breakfast with decided advantage. The douche should not be used for the first two baths, as it may excite too much action in the vessels of the affected part, and inflammation may be produced instead of the healthy reparatory process it is so desirable to promote.

Sometimes too great excitement in the system is induced by the use of the Bath, and the feverish symptoms consequent on it are attended with considerable increase of pain in the part originally affected. Many of the distressing characteristics of acute rheumatism return, and the patient is apt to be discouraged and disappointed. In such cases a repetition of the medicine recommended to be taken at the commencement of the course, and a hot bath on the following day at a temperature of 96 degrees, are generally followed by complete relief, and the patient is enabled to return to the Natural Bath, and is often rather benefited than otherwise by the interruption.

There are still two other matters of primary importance in the application of every remedial agent, which the invalid who seeks a restoration to perfect health, must never lose sight of for an instant, viz., diet and exercise. One of the first beneficial effects of the Buxton Waters, and one which we must always have present in the transition from disease to health, is an increased appetite, and a restoration of the tone of the stomach, and it requires considerable firmness in a man who has very probably been *gruelled* for months, to resist the many attractive dishes with which the tables at the

different hotels are supplied, and confine his patronage to those which are simply nutritious and easy of digestion. The immediate penalty he must pay for this self-indulgence is generally considered as a sufficient punishment, and I have known some men who would risk a sleepless night, and a recourse to medicine, rather than deny their palate some trifling gratification. But the consequences of such folly are not so easily got rid of, as every interruption in the progress of cure abstracts so much from the strength of the constitution, and the disease thereby gets more firmly seated, and will, of course, require a greater effort to remove it. Peculiarities of constitution sometimes occur in which eccentricities of diet seem to be absolutely necessary, but, generally speaking, plainly cooked food, repeated at proper intervals, will be found to agree the best. For breakfast two small cups of tea or coffee, with a slice of bacon, the yolk of a light boiled egg, and dry toast, is sufficiently nutritious and easy of digestion—and dinner, which should be taken about midday, by those who have been much debilitated by their previous sufferings, should consist of a mixture of animal and farinaceous food, if the stomach will bear it, and at least an hour's rest afterwards should be observed. A mutton chop, a beef steak rather underdone, or the same description of meat plainly roasted or boiled, with rice or a very mealy potato, and a light pudding of sago, tapioca, or arrowroot, after, will agree with almost every constitution. A very valuable addition to our stock of farinaceous food has recently been made by Mr. Bullock, of London, in Semola, one of the lightest and most nutritious agents we possess. He has also suggested boiled wheat, which I have found to be one of the most nutritious of vegetables, and generally obviates constipation. It is prepared by boiling wheat for two hours, and served with gravy or butter sauce. The mixture of the bran and gluten renders it both nutritious and aperient. Lamb and veal must be avoided as requiring strong digestive powers, but white fish, as trout, whiting, haddock, sole, or cod, and chickens, with every description of game, enable the invalid to have an almost endless variety of light, pleasant,

nutritious food, from which to choose the important meal of the day. A few vegetables may be allowed in the *carte*, as brocoli, cauliflower, and tender peas, but these must be better boiled than one usually meets with them at public tables, in order not to be positively injurious. Great discrepancy of opinion exists as to the drink best calculated for the invalid, and when we look at the volumes which have been written within the last few years on this part of dietetics, we are puzzled how to decide, as we hear all fermented and spirituous liquors denounced on the one hand as positive poisons, and on the other, see men who have reached the utmost limits of human life laid down by the Psalmist, and have been in the habit of taking a certain quantity of beer, wine, or spirits every day. I believe that many writers on this subject have formed their dogmas from their own cases, and have laid down as rules for the rest of mankind those principles of diet, which they have found to agree best with themselves. Such a mode of proceeding requires little confutation, and every man is, or at least ought to be, the best judge for himself, whether a small quantity of any form of stimulant agrees with him or not. When taken in excess there cannot be two opinions of its injurious tendency; but I have often seen a few glasses of sound Sherry, Madeira, or Hock, or weak brandy and water, assist digestion, and those who have been in the habit of taking a few glasses of wine every day cannot leave it off entirely without suffering from it. With gouty and rheumatic patients, where there is a tendency in the constitution to convert all fluids into acids, malt liquor would disagree, but others who have not such tendency may take a glass of sound bitter ale, or London stout, with decided advantage. Popular rules for diet are now published at so cheap a rate, and the various articles of food and drink so accurately tested and examined, that there is no excuse for any man being ignorant of their qualities, and as experience must teach the most careless certain lessons which cannot be disregarded with impunity, it is unnecessary to swell out this work with a larger catalogue. Tea should be taken about six o'clock, if taken at all, avoiding buttered toast, muffins, and the whole class of tea breads; and boiled

milk, or some preparation of sago or arrowroot, for supper, an hour at least before going to bed.

Exercise is of nearly as much consequence as diet in the cure of disease, as if kept within proper bounds it assists the circulation and distribution of all the fluids, increases the appetite, prepares for sound sleep, and restores the firmness of the whole muscular system. If carried beyond the point of fatigue, it weakens the body by exhausting the nervous energy, gives rise to restlessness and indigestion, and injures the diseased limbs which have not properly regained their strength. When commenced in moderation, it may be increased in duration every day, till at the end of a week often, the convalescent is able to perform feats of locomotion which he deemed impossible. *Festina lente*, or slow but sure, should be the motto.

J. AND W. D. SUTTON, PRINTERS, HERALD OFFICE, BUXTON.